MonPS08

Development of superconducting magnet and LHe recondensing cryostats for RAON 28 GHz ECR Ion Source

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RAON, 28GHz electron cyclotron resonance ion source (ECR IS) was designed and tested as a Rare Isotope Science Project (RISP). It is expected that RAON would provide not only rare isotope beams, but also stable heavy ions, ranging from protons to uranium. In order to have the required steady heavy ion beam for ECR IS, we have to use 28 GHz microwave source, as well as the requirement of a high magnetic field. The superconducting magnet using NbTi wire was designed and manufactured for producing ECR IS, and test was conducted. In this paper, the ECR IS design and fabrication process are presented of the superconducting magnet and LHe recondensing cryostats. Experimental results show the quench current is increased whenever quench occurs, but not yet reached the designed current. The experiment is going to find the best requirement to reach designed current and the heat capacity of LHe recondensing cryostats is analyzed according to RF power and current.